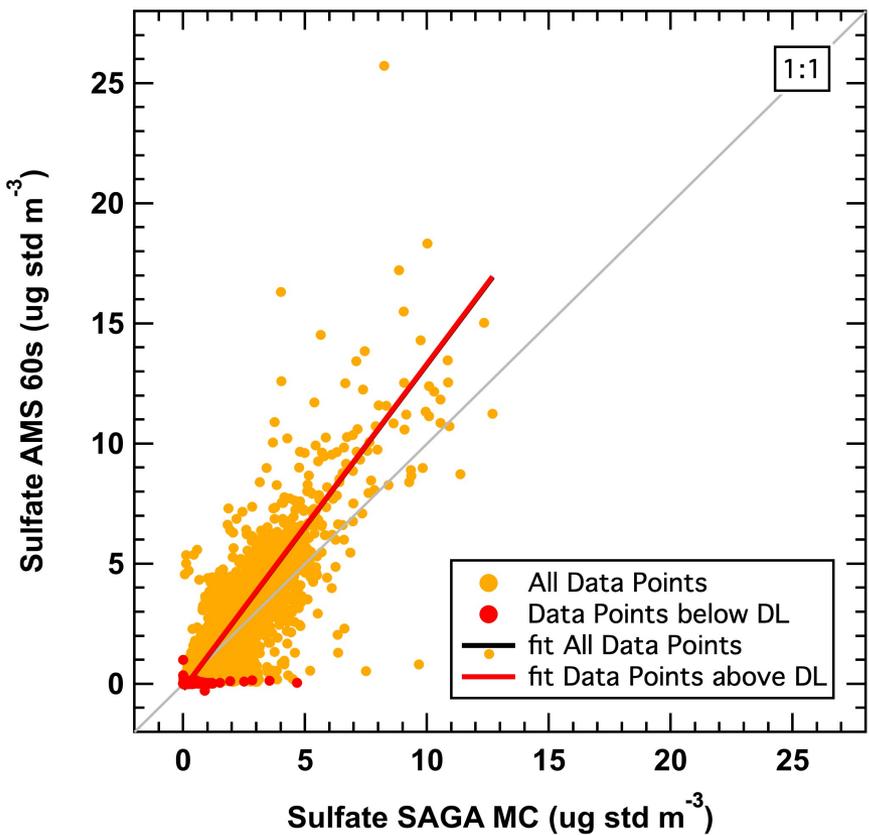


# Sulfate – AMS vs SAGA-MC

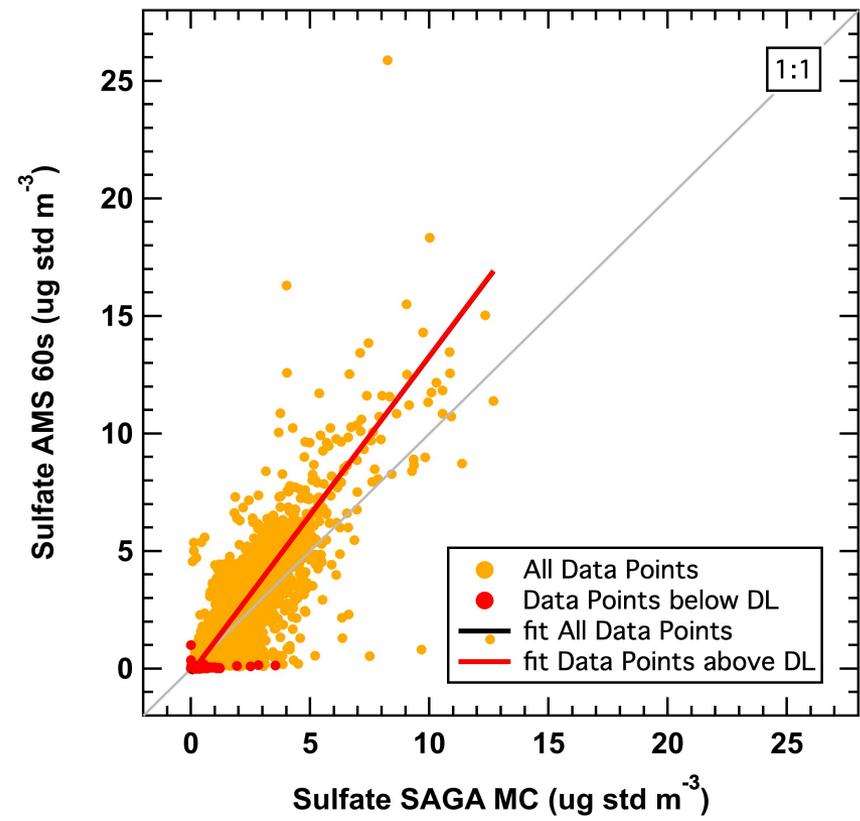
AMS measurements include organic sulfate. SAGA measurements only include the inorganic ionic forms.

Archive SAGA-MC Merge



All Data Points	Data Points Above DL
(6862 pts)	(6505 pts)
$y = a + bx$	$y = a + bx$
$a = -0.208 \pm 0.014$	$a = -0.210 \pm 0.0014$
$b = 1.350 \pm 0.008$	$b = 1.353 \pm 0.008$
$R^2 = 0.792$	$R^2 = 0.791$

Manual Merge 70% Data

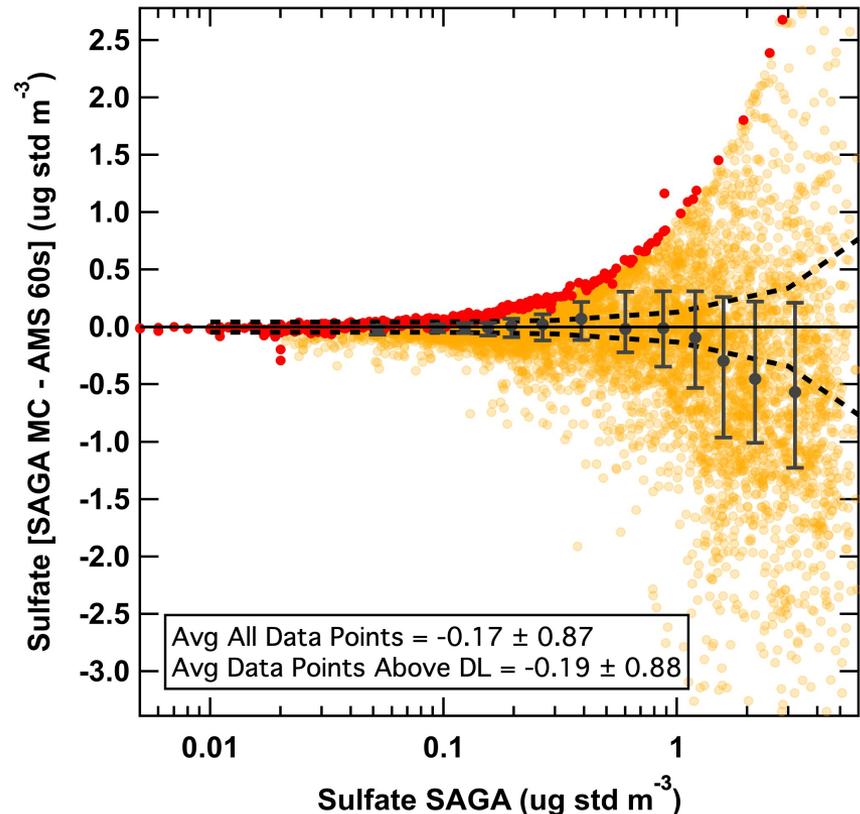


All Data Points	Data Points Above DL
(6388 pts)	(6020 pts)
$y = a + bx$	$y = a + bx$
$a = -0.210 \pm 0.014$	$a = -0.214 \pm 0.015$
$b = 1.353 \pm 0.008$	$b = 1.355 \pm 0.008$
$R^2 = 0.792$	$R^2 = 0.790$

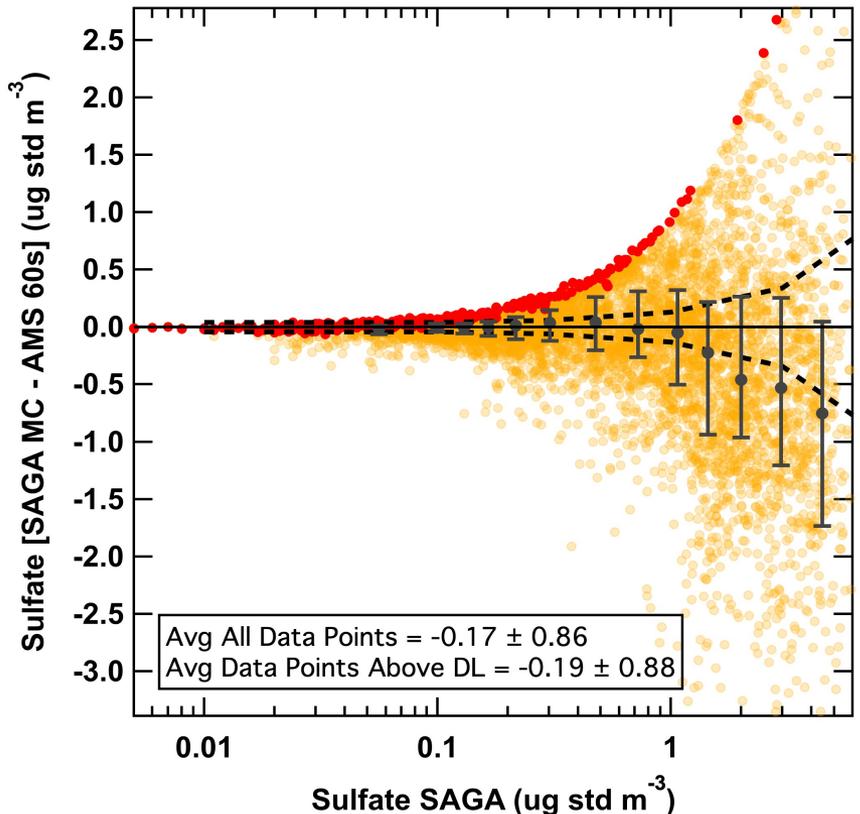
# Difference dependence on SO<sub>4</sub> value

Uncertainty envelopes based on SAGA-MC time base combined data uncertainty  
(AMS 60s calculated from data file, SAGA =  $\pm (0.021 \text{ ug std m}^{-3} + 10\%)$ )

### Archive SAGA-MC Merge



### Merge with 70% Data



(● All Data Points, ● Data Points < DL)



**Data:**

- seac4rs-mrgSAGAMC-dc8\_merge\_20130806\_R5\_thru20130923.ict
- seac4rs-AMS-60s\_DC8\_#####\_R1.ict (##### = daily files from 20130806 – 20130923)
- seac4rs-SAGA-MC\_DC8\_#####\_R1.ict (##### = daily files from 20130806 – 20130923)

**Correlation:**

- Merge with 70% data are calculated using 60s AMS data files. Data points removed when flagged for potential inlet artifacts (IceFlag). Each merge interval must contain at least 70% of data for analysis.
- AMS 60s DL: reported in data file, propagated to SAGA-MC time interval.
- SAGA-MC and AMS 60s data points below the DL are colored red.
- AMS measurements include organic sulfate, whereas SAGA-MC measurements only include inorganic ionic forms.
- Data reported at STP (273 K & 1013 mb).
  
- Fit lines are derived from orthogonal distance regressions.
- R<sup>2</sup> values are calculated independently, not from orthogonal distance regression.

**Uncertainty propagation (Uncertainties provided by PIs).**

- AMS 1s precision: reported in data file, propagated to SAGA-MC time interval using quadrature average.
- SAGA-MC uncertainty:  $\pm [10\% + 0.02 \text{ ug std m}^{-3}]$

**Difference dependence on SO<sub>4</sub> value:**

- Relative difference calculated by SAGA-MC – AMS 60s.
- Median, 25<sup>th</sup>, and 75<sup>th</sup> percentiles based on 500 data point bins after data is sorted by SAGA-MC values.
- Uncertainty envelopes based on uncertainty in data file (SAGA-MC) and AMS 1s propagated precision.

Summary: Archived SAGA-MC merge

<b>Data Range</b>	<b># Points</b>	<b># Pts within Combined Unc.</b>	<b># Pts within 2*Combined Unc.</b>
All	6862	4097 (60%)	5926 (86%)

Summary: Merge with 70% data

<b>Data Range</b>	<b># Points</b>	<b># Pts within Combined Unc.</b>	<b># Pts within 2*Combined Unc.</b>
All	6388	3787 (59%)	5512 (86%)